

April 19, 1932.

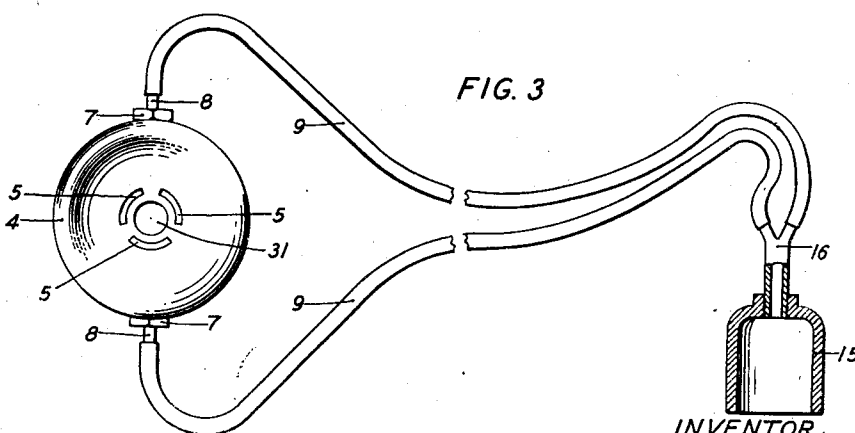
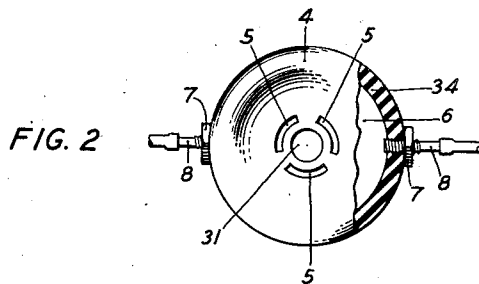
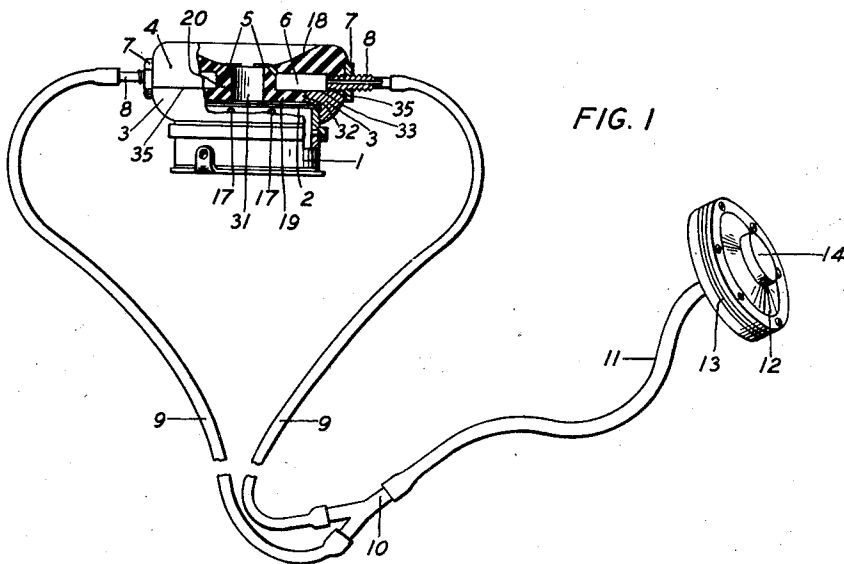
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1,854,802

TELEPHONE RECEIVER

Filed Dec. 31, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

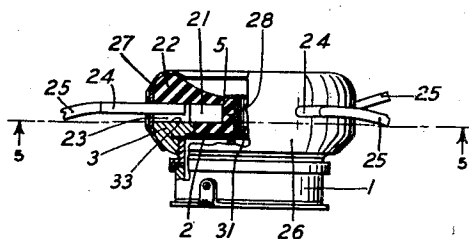


FIG. 4

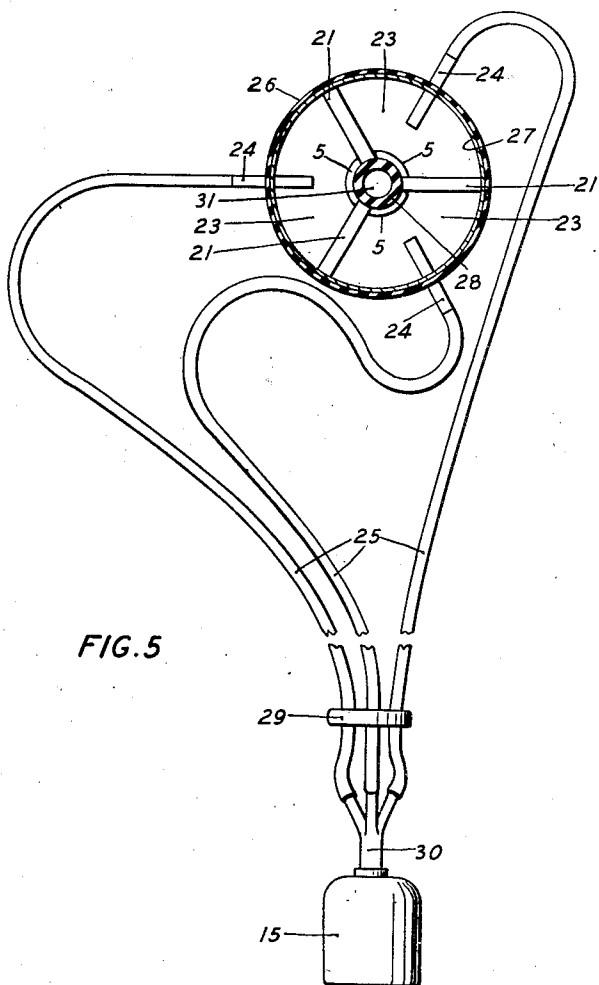


FIG. 5

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TELEPHONE RECEIVER

Application filed December 31, 1930. Serial No. 505,803.

This invention relates to telephone receivers and has particular reference to a receiver for use in connection with apparatus for measuring noise.

5 According to this invention the noise, the intensity of which is to be measured, and certain diaphragm tones are received simultaneously in the ear of the observer from respective paths in the receiver earpiece, the
10 path for the noise being through a chamber in said earpiece which is concentric preferably to that of the diaphragm tone sound path at the center of the earpiece.

In accordance with one embodiment of
15 this invention, there is provided a telephone receiver comprising a casing, a diaphragm, means for actuating the diaphragm, means defining a sound path leading from the diaphragm and a sound chamber concentric,
20 preferably to the sound path and having an inlet and an outlet opening, the outlet opening being located in proximity to the outlet of the sound path and the inlet opening leading from a source of sound vibration to be
25 measured or examined. In the embodiments disclosed the sound path and sound chamber defining means comprises an earpiece secured to a clamping ring threading onto the receiver casing and acting to hold the receiver
30 diaphragm in place.

A more complete understanding of this invention will be obtained from the description which follows and by reference to the appended drawings, wherein,

35 Fig. 1 is a side assembly view of a telephone receiver embodying the earpiece of this invention showing the earpiece and certain operating portions of the receiver partially broken away;

40 Fig. 2 is a plan view of the receiver shown in Fig. 1 with a portion thereof broken away;

Fig. 3 illustrates another embodiment of this invention;

45 Fig. 4 is a side assembly view of a telephone receiver embodying still another embodiment of this invention; and

Fig. 5 is a sectional view of Fig. 4 along the line 5—5 looking upwardly.

Referring now to the drawings, and particularly to Figs. 1, 2 and 3, the telephone re-

ceiver to which this invention is applicable generally comprises a casing 1 housing a permanent magnet (not shown), a pair of electromagnets having pole pieces 17 and a diaphragm 2 disposed in attractable relation
55 to the pole pieces 17. This diaphragm is held in position on the casing 1 by a clamping ring 3 having preferably a plane face 33 and an interiorly threaded aperture 32 provided for a purpose hereinafter described.
60 The receiver earpiece 4 comprises a portion 18 adapted to be placed adjacent the ear of an observer or user of the telephone receiver and having a concave upper surface and having integral therewith an annular centrally
65 apertured portion 20 integral with an externally threaded flange or disc portion 19 and which threads into the interiorly threaded clamping ring 3. The portion 18 of the ear-
70 piece 4 is provided also with an annular flange 34 whose lower surface 35 is adapted to clamp against the plane surface 33 of the clamping ring 3 when the earpiece portion 19 is threaded into the clamping ring 3 to form an annular chamber 6 which is concentric pre-
75 ferably with the main sound path 31 provided by the central aperture in the earpiece portion 20 leading from the diaphragm 2 upwardly to the concave surface of the earpiece portion 18. Concentric to sound path 31 and
80 in proper spaced relation therewith there is disposed a number of arcuately shaped openings or slots 5 which connect the concave surface of the earpiece with the chamber 6 formed by the clamping ring and the ear-
85 piece. These openings form paths for the sound waves which are conducted into said chamber in a manner now to be explained.

Into threaded openings in the annular portion 34 of the earpiece 4 are threaded hollowed studs 8 to one extremity of which flexible tubing 9 may be attached. The studs 8 may be maintained in proper position by lock
90 nuts 7. It is apparent, of course, that, if desired, these studs 8 could be formed integrally with the earpiece 4. The tubing 9 connects with a Y connection to one branch of which is attached tubing 11 leading to the casing
95 13 of a stethoscopic pick-up device compris-

ing a diaphragm 12 and a vibrations localizing member 14.

In certain mechanical systems, where there are moving parts, the noise may be such as to cause considerable annoyance to either the user or the people in proximity thereto. This is particularly true in the higher class automobiles where noiselessness of operation is a very desirable characteristic and one of the problems which automotive engineers are continually striving to solve. Engine noises, bearing noises, body noises and the like may be studied and measured utilizing this invention. Not only is this invention applicable to the study of noises or other sounds originating in mechanical devices but it may be used in studying noises of the human body, for instance, in the region of the heart and of the lungs.

The telephone receiver earpiece 4 is held against the ear of the observer and the sound localizing member 14 is held against the source of noise. The vibrations picked up by the member 14 are conducted through the tubings 11 and 9 into the chamber 6 and therefrom through the slots or openings 5 to the ear of the observer. Simultaneously the receiver may be made to produce a tone which travels along the sound path 31 to the ear of the observer, said receiver being connected, for instance, in a circuit such as is shown in U. S. Patent 1,673,037, issued to D. G. Blattner on June 12, 1928, whereby the intensity of said tone may be varied until it is just perceptible in the presence of the noise sound. If an appropriate datum has been selected the intensity of the tone required may be adopted as an expression of the noise intensity. By varying the position of the sound localizing member 14 with reference to the noise source being examined the nature and distribution of the noise may be completely studied.

A modification of the noise pick-up device shown in Figs. 1 and 2 is shown in Fig. 3. Tubings 9, 9 are shown connected to a Y connection 16, one branch of which is attached to a cylindrical cup member 15 adapted to enclose that portion or area of a body from which noise disturbances emanate.

A further modification of this invention is shown in Figs. 4 and 5 which illustrate how the telephone receiver earpiece disclosed in U. S. Patent 1,746,800, issued to K. P. Seacord on February 11, 1930, may be modified in accordance with this invention. The telephone receiver shown in the referred to patent is provided with an annular member 27 which fits tightly, preferably, about the earpiece 22 to block off the radial paths provided by the fin members 21 from the atmosphere. As an aid to holding the member 27 in proper position and also to prevent leakage of sound into or out of the chambers 23, a ring 26 of a flexible material, such as soft rubber, is

placed about the telephone receiver so as to enclose the earpiece 22, the annular member 27, and the clamping ring 3. The members 26 and 27 are provided with coaxial apertures through which are thrust tubular elements 24, preferably of hard rubber, which extend into each of the chambers 23 and which may be manually adjusted in position with reference to the openings or slots 5 leading from said chambers. If the openings in the member 26 are made slightly smaller than the size of the elements 24 the latter will be maintained in adjusted position by the gripping action thereof. To each of the elements 24 is attached a tubing 25 passing through guide member 29 and connecting with a branch of a connection 30 which is attached to a cup member 15 similar to that shown in section in Fig. 3. In use, the noise disturbance to be examined and measured is caused to be conducted through the cup member 15, the connection 30 to the tubings 25, into the chambers 23 and through the slots or openings 5 to the ear of the observer.

It is to be understood, of course, that although this invention has been described with reference to a number of specific embodiments, its scope is to be considered as limited only by the appended claims.

What is claimed is:

1. In a telephone receiver, a receiver casing, a diaphragm, a clamping ring for holding the diaphragm in place, and an earpiece secured to said clamping ring, said earpiece having a central opening and an annular chamber therein with inlet and outlet openings for sound waves.

2. In a telephone receiver, a receiver casing, a diaphragm, a clamping ring for holding the diaphragm in place, and an earpiece secured to said clamping ring, said earpiece having a central opening and an annular chamber therein with inlet and outlet openings for sound waves, the outer ends of said outlets terminating adjacent to said central opening.

3. In a telephone receiver, a receiver casing, a diaphragm, means for vibrating said diaphragm to cause it to produce sound waves, and means defining a sound path for said sound waves and a sound chamber providing a passage for sound waves other than those produced by said diaphragm, said chamber being annular and surrounding said diaphragm sound path and having an inlet and an outlet opening.

4. In a telephone receiver, a receiver casing, a diaphragm, means for vibrating said diaphragm to cause it to produce sound waves, means defining a sound path for said sound waves and a sound chamber providing a passage for sound waves other than those produced by said diaphragm, said sound path and sound chamber having outlet openings in close proximity, and means for in-

roducing sound waves into said sound chamber.

5. In combination, a telephone receiver having a receiver casing, a diaphragm, means defining a plurality of concentric sound paths having their outlet openings in proximity to each other, one of said sound paths leading from said diaphragm and another of said sound paths providing a path for vibrations from a vibrating body, and means for conducting such vibrations into said sound path, said means comprising a sound translating member to be placed against said vibrating body and a sound confining tube.

6. In combination, a telephone receiver having a receiver casing, a diaphragm, an earpiece having a sound path leading from said diaphragm, means engaging the receiver casing, said means and said earpiece defining a sound chamber, said chamber having an outlet in proximity to the mouth of said diaphragm sound path, and means for conducting sound disturbances, other than those from said receiver, into and through said chamber.

7. In combination, a telephone receiver having a receiver casing, a diaphragm, means defining a sound path leading from said diaphragm and a sound chamber concentric with said sound path, said chamber having an outlet in proximity to the mouth of said sound path, and means for conducting vibrations, other than those from said receiver, into said chamber.

8. In combination, a telephone receiver having a receiver casing, a diaphragm, an earpiece having a sound path leading from said diaphragm, means for engaging the receiver casing, said means and said earpiece defining a sound chamber concentric with said sound path, said chamber being provided with an outlet in proximity to the mouth of said sound path, and means for conducting sound waves into said chamber, said means comprising a sound translating member to be placed against a vibrating body and a sound confining tube.

9. In combination, a telephone receiver having an earpiece provided with a sound path at its center, means for engaging the receiver case, said earpiece and said means cooperating to form a sound chamber therebetween, portions of said earpiece defining an inlet and an outlet opening to said chamber, and means for introducing sound waves into said chamber through said inlet opening.

10. In a telephone receiver, a casing, a diaphragm, means for clamping said diaphragm on said casing, an earpiece having a portion defining a central sound path, said portion having a flanged portion for engagement with said clamping means, and an annular flange to be clamped against the peripheral portion of said clamping means, and to form therewith an annular sound chamber,

said annular flange having an opening therein through which sound waves may be introduced into said sound chamber, the earpiece having an opening adjacent its central path through which said sound waves have egress from said sound chamber.

11. In combination, a telephone receiver having a receiver casing, a diaphragm, an earpiece having a sound path leading from the diaphragm of said receiver, means to secure said earpiece to said receiver casing, said means and said earpiece defining a sound chamber, means dividing said chamber into a plurality of compartments, each of said compartments having an inlet and an outlet opening, and means for conducting sound disturbances into and through each of said compartments, the outlet opening therefrom being in proximity to the mouth of the central sound path.

12. In combination, a telephone receiver having a receiver casing, a diaphragm, an earpiece having a sound path leading from the diaphragm of said receiver, means to secure said earpiece to said receiver casing, said means and said earpiece defining a sound chamber, means dividing said chamber into a plurality of compartments, each of said compartments having an inlet and an outlet opening, and means for conducting sound disturbances into and through each of said compartments, said means having terminations extending through the inlet openings to said compartments and adjustable in position with reference to the outlet openings therefrom.

13. A telephone receiver comprising a casing, a diaphragm, means in said casing for vibrating said diaphragm, means connected to said casing and providing a sound path for sound vibrations produced by said diaphragm, said second mentioned means containing a sound chamber having inlet and outlet openings, the outlet opening being adjacent the outlet end of the sound path for the diaphragm vibrations, the inlet opening being defined by a tubular member extending into said second mentioned means, and means connected to said tubular member for introducing vibrations into said sound chamber, said vibrations being produced by a body outside of the receiver.

In witness whereof, I hereunto subscribe my name, this 29th day of December, 1930.
ARTHUR MEYER.